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CLAIMS

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[The scope of a claim for utility model registration]

[Claim 1]In slide resistance matting which laminates matting, an adhesive layer or an adhesives layer, a base, and a slip resistance layer at least, Slide resistance matting in which a slip resistance layer consists of a constituent which uses a fizz microcapsule, adhesives, and paints as the main ingredients, and a rate of a compounding ratio of this fizz microcapsule consists of three to 50 weight section to adhesives 100 weight section.

[Claim 2]Slide resistance matting given in a claim (1) adhesives contained in a slip resistance layer is [ a given glass transition temperature ] adhesives 40 \*\* or less.

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[Translation done.]

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DETAILED DESCRIPTION

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[Detailed explanation of the device]

[Industrial Application]

This design is related with the slide resistance matting excellent in slide resistance, such as a tatami, \*\*, a carpet, and a mat.

[Description of the Prior Art]

Various kinds of things are known by matting.

It is used for the following purposes etc., respectively.

\*\* The matting keep it from becoming dirty even if cover the room of the wooden floor usually used with its shoes on, and it enables it to go up with bare feet or it carries out every [ of the article / direct ] to a floor, \*\* The matting which covers a floor and prevents the dirt of the floor, the matting which covers \*\* floor and hides dirt and the bruise of the floor, \*\* There are the matting which covers a floor and gives cushioning properties to the floor, matting which covers \*\* floor and prevents the cold from an under floor, matting which covers \*\* wooden floor and changes a Western-style room into Japanese-style room space, matting which covers \*\* floor and accents, matting to which \*\* floor is covered and the dirt of bare feet or footwear is dropped, etc. Specifically, matting, such as \*\*, a tatami mat, a carpet, or a mat, is used for the floor which consists of a tatami, a board, etc. These days, since the carpet currently used especially in residences, such as an apartment, having been fond serves as a hotbed of ticks easily, flooring(wooden floor)-ization of a floor progresses and, for this reason, use of \*\*\*\*\* and a tatami mat is in fashion.

However, since it is not usually necessarily being fixed to the floor, it is easy to move while in use, and if this tatami mat, \*\*, a carpet, a mat, etc. are not careful, they have the danger that the room will make it disorderly by the movement, or people will fall.

[Problem(s) to be Solved by the Device]

As a result of inquiring in view of this actual condition, by providing a slip resistance layer in rear faces, such as a tatami, \*\*, a carpet, and a mat, this person finds out that matting without the above-mentioned problem is obtained, and came to complete this design.

[The means for solving a technical problem]

In the slide resistance matting in which this design laminates matting, an adhesive layer or an adhesives layer, a base, and a slip resistance layer at least, Slide resistance matting in which a slip resistance layer consists of a constituent which uses a fizz microcapsule, adhesives, and an inorganic pigment as the main ingredients, and the rate of a compounding ratio of this fizz microcapsule consists of three to 50 weight section to adhesives 100 weight section.

This design indicates the slide resistance matting in which a base contains a nonwoven fabric or foam.

This design indicates the slide resistance matting in which a base contains at least one base material chosen from paper and a film.

A slip resistance layer consists of a fizz microcapsule, adhesives, and paints, and the mode of this design is characterized by the rate of a compounding ratio of this fizz microcapsule being three to 50 weight section to adhesives 100 weight section.

[Function]

A tatami, \*\*, a carpet, a mat, etc. can be illustrated as matting including various kinds of matting, such as a sheet shaped and mat state, about this design.

The matting of this design is explained still in detail based on a drawing.

Drawing 2 is a sectional view showing an example of the slide resistance matting known conventionally. The slide resistance matting (1) of Drawing 2 is what provided the slip resistance layer (3) in the rear face of matting (2) directly, and is a simple construct. Drawing 1, Drawing 3, and Drawing 4 are sectional views showing the slide resistance matting (1) of this design. The slide resistance matting (1) of Drawing 1 is what pasted together to

the rear face of matting (2) base materials (4) which provided the slip resistance layer (3), such as paper or a film, via the adhesives layer (5). It excels in the point that the point that processing is easy and slip resistance layer to the main part of matting do not permeate matting from the slide resistance matting (1) of Drawing 2 etc. The slide resistance matting (1) of Drawing 3 is what was pasted together to the rear face of matting (2) via the adhesives layer (5), after pasting together to a nonwoven fabric or foam (6) base materials (4) which provided the slip resistance layer (3), such as paper or a film. In the case of use — the cushioning properties of a nonwoven fabric or foam (6) are effective, and comfortableness and a going-up feeling are better than the slide resistance matting (1) of Drawing 1 — it is comfortable. After the slide resistance matting (1) of Drawing 4 pastes together to a nonwoven fabric or foam (6) base materials (4) which provided the slip resistance layer (3), such as paper or a film. It is what constituted the base, pasted together base materials (9), such as another paper or a film, to the nonwoven fabric or foam side side, and pasted this layered product together to the rear face of matting (2) via the adhesives layer (5) continuously. Even if it compares with any of Drawing 1 and Drawing 3, it excels most in respect of processability, the amenity in the case of use, etc. The thing of the gestalt like Drawing 5 which provided the slip resistance layer in the rear face of matting (2) selectively as slide resistance matting of this design is mentioned.

The slip resistance layer (3) used for this design uses a fizz microcapsule, adhesives, and paints as the main ingredients, and the rate of a compounding ratio of this fizz microcapsule consists of 3 – 50 weight section to adhesives 100 weight section.

The slip resistance layer which becomes below from the presentation like the above is described.

The slip resistance layer containing a fizz microcapsule applies the coating liquid which usually contains a fizz capsule, and it is continuously formed by carrying out heat foaming processing. For example, in the device of Drawing 1, Drawing 3, and Drawing 4. Usually, the smear of the capsule content coating liquid is carried out to base materials, such as paper or a film, etc. using a coater or a printing machine. Then, heat-treat, constitute a slide resistance sheet and then in the device of Drawing 1, said slide resistance sheet is stuck directly at matting. After sticking on matting (2) after pasting said slide resistance sheet together with a nonwoven fabric or foam in the case of Drawing 3, and pasting together a nonwoven fabric or foam (6) and a base material (9), and (paper or a film) one by one at said slide resistance sheet in the case of Drawing 4, it is obtained by sticking on matting (2). After constituting the base in which a base material, a nonwoven fabric, or foam pasted formation of the slip resistance layer together in the device of Drawings 3 or 4, it can also carry out, and in the device of Drawing 4, a slip resistance layer can also be formed after pasting of a base material, a nonwoven fabric or foam, and a base material.

In order to do easy the work which sticks a slide resistance sheet on matting in the device of Drawing 1, Drawing 3, Drawing 4, and Drawing 5, for example, it constituted using the adhesive layer (7) as an adhesives layer (5), use of the sheet shown in Drawing 6 and Drawing 7 is desirable. After this slide resistance sheet removes a releasing paper (8), it is stuck on matting (2), and the matting of Drawings 3 or 4 is obtained, respectively. After it sticks it with a releasing paper (8) after carrying out the smear of the formation of the adhesive layer in that case (7) to a direct base material, a nonwoven fabric or foam, etc., and it carries out the smear of the adhesive layer (7) to a \*\*\*\*\* method or a releasing paper (8), it is stuck with a base material, a nonwoven fabric or foam, etc., and is performed by any of a \*\*\*\*\* method they are. Thus, an order of processing in this design is suitably chosen in consideration of physical properties, such as the heat resistance of material, or processability, and workability to be used.

When using a binder as adhesives, binders, such as a rubber system, acrylic, a polyether system, and an ethylene-vinyl acetate system, are used, for example. The releasing paper (8) in particular both used is not limited, but a publicly known thing is used in this industry.

Incidentally, adhesives or a binder is applied so that it may usually become the range of 5 – 100 g/cm<sup>2</sup> with dry weight.

A fizz microcapsule and the adhesives for adhering this to a base are blended by a specific ratio, and fizz microcapsule content coating liquid is prepared considering what added paints further as a fundamental component.

The fizz microcapsule used for this design is a microcapsule which has the character in which particle diameter increases with heating.

Low-boiling-point hydrocarbon like n-butane, i-butane, pentane, and a neopentane as a core substance is specifically included, Acrylic ester like a vinylidene chloride, acrylonitrile, and methyl methacrylate (meta) as a wall membrane agent of a capsule. The microcapsule which uses the thermoplastics which uses an aromatic vinyl compound like styrene as the main ingredients (as a commercial capsule). It is mentioned that the Matsumoto microsphere F-30, F-50, F-80 (product made from the Matsumoto fats and oils). Expancel WU-642, WU-551, and WU-461 (product made from Japanese phyllite) can be illustrated etc.

As adhesives in a slip resistance layer, when applying as an aqueous system, a water soluble binder and a latex system binder are used, and when applying as a non-aqueous system, an oil-soluble binder is used. When hardening by an electron beam or ultraviolet rays, the monomer which has an ethylene nature unsaturated bond, oligomer, or a prepolymer is used.

As a water soluble binder, for example Gelatin, albumin, casein, Grain starch, pregelatinization starch, oxidized starch, etherification starch, esterification starch, Carboxymethyl cellulose, hydroxyethyl cellulose, agar, Water-soluble nature or semisynthesis high molecular compounds, such as sodium alginate and gum arabic, Polyvinyl alcohol, denaturation polyvinyl alcohol, a polyvinyl pyrrolidone, Water-soluble synthetic high polymers, such as polyacrylic acid, polyacrylamide, an ethylene maleic anhydride copolymer, a styrene maleic anhydride copolymer, a methyl vinyl ether maleic anhydride copolymer, isobutylene, a maleic anhydride copolymer, are mentioned.

As a latex system binder, styrene butadiene latex, Acrylonitrile butadiene latex, acrylic ester system latex, vinyl acetate system latex, polyvinylidene chlorides latex, methyl methacrylate butadiene latex, these carboxy denaturation (for example, acrylic acid) latex, etc. are mentioned.

As an oil-soluble binder, for example Rosin, KOPARU, Dalman, gilsonite, Natural resins, such as zein, hardened rosin, dimerization rosin, polymerization rosin, maleic acid resin, Fumaric acid resin, methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, Hydroxypropylcellulose, ethyl hydroxyethyl cellulose, Cellulose acetate propionate, cellulose acetate butyrate, Semi-synthetic resin, such as a nitrocellulose, phenol resin, xylene resin, Urea resin, melamine resin, ketone resin, coumarone-indene resin, petroleum resin, Terpene resin, cyclized rubber, chlorinated rubber, alkyd resin, polyamide resin, an acrylic resin, polyvinyl chloride, polyvinyl acetate, a polyvinyl chloride acetate copolymer, chlorinated polypropylene styrene resin, an epoxy resin, polyurethane resin, a polyvinyl butyral, etc. are mentioned.

As the monomer which has an ethylene nature unsaturated bond hardened by an electron beam or ultraviolet rays, oligomer, and a prepolymer, For example, styrene, methyl methacrylate, butyl methacrylate, polyethylene-glycol diacrylate, Propylene glycol diacrylate, pentaerythritol acrylate, Trimethylolpropane diacrylate, pentaerythritol tetraacrylate, The reactant of hexanediol diacrylate, 1,2-butanediol diacrylate, an epoxy resin, and acrylic acid, the condensate of maleic acid, acrylic acid, and a diethylene glycol, etc. are mentioned.

The glass transition temperature in which the especially most desirable thing as adhesives tends to reveal high slide resistance is a thing 40 \*\* or less.

A fizz microcapsule and adhesives are blended so that a fizz microcapsule may usually serve as five to 30 weight section preferably three to 50 weight section to adhesives 100 weight section.

As a medium used for non-aqueous system coating liquid, for example Benzene, toluene, Xylene, hexane, cyclohexane, trichloroethylene, methyl ethyl ketone, Methyl isobutyl ketone, methyl acetate, ethyl acetate, butyl acetate, methyl cellosolve, Ethylcellosolve, butyl cellosolve, methanol, ethanol, n-propyl alcohol, isopropyl alcohol, n-butanol, n-hexanol, cyclohexanol, a diethylene glycol, etc. are mentioned.

When hardening by ultraviolet rays using the monomer which has an ethylene nature unsaturated bond hardened by ultraviolet rays as adhesives, oligomer, and a prepolymer, a sensitizer is added for a photopolymerization initiator again if needed in coating liquid.

As a photopolymerization initiator, for example Benzoquinone, phenanthrene quinone, A naphthoquinone, diisopropyl phenanthrene quinone, benzoin butyl ether, benzoin, furoin butyl ether, a Michler's ketone, a MIHIRA thioketone, fluorenone, trinitro fluorenone, etc. are mentioned.

The loadings of a photopolymerization initiator are usually the range of 0.1 to 10 weight section to ethylene nature unsaturated compound 100 weight section.

As a sensitizer, triethanolamine, N-methyldiethanolamine, N,N-dimethylethanolamine, N-methylmorpholine, etc. are mentioned, for example.

As for the gestalt of fizz microcapsule content coating liquid, a fizz microcapsule and inorganic pigments other than adhesives, such as silica, calcium carbonate, aluminium hydroxide, clay, kaolin, titanium oxide, and a zinc oxide, were added by coating liquid. Prevention from blocking is aimed at and ten to 80 weight section is usually more preferably added by addition of an inorganic pigment five to 150 weight section to adhesives 100 weight section. To coating liquid, fine adhesion particles, a surface-active agent, a dispersing agent, a spray for preventing static electricity, a defoaming agent, colorant, fluorescent dye, etc. which are further used for release agents, such as polyethylene wax, and the gummed paper for re peeling off if needed can be added suitably.

As a coater used, an air knife coater, a bar coating machine, a roll coater, a photogravure coating machine, etc. are used, and photogravure, a screen, flexo one, etc. are used as a printing machine.

the case where a fizz capsule layer is used as a slip resistance layer in this design — a slip resistance layer — dry weight — the range of 3 - 500 g/m<sup>2</sup> — it is provided so that it may become the range of 12 - 70 g/m<sup>2</sup> more preferably. Incidentally, if there is too little weight, sufficient slide resistance will not be obtained. By less than 12

$\text{g/m}^2$ , the fall of the slide resistance by repetitive friction is large, therefore when using it for a long period of time, it may become a problem. On the other hand, if there is too much coverage, about slide resistance and abrasion resistance, it is satisfactory, but it is not desirable in respect of economical efficiency. Foaming of a capsule is usually performed under about 80–300 °C conditions using heating apparatus, such as a hot-air-drying zone of a coater, an infrared irradiation device, and a heating super calender.

As paper used as a base material about this design, a thing with a thickness of about 10–500 micrometers of paper of fine quality, kraft, art paper, coat paper, fine coated paper, a synthetic paper, etc. is mentioned, for example. The thing which made knot \*\*, a bark, shives, etc. mix in colored kraft especially is preferred from a point of fanciness.

As a film, a film with a thickness of about 5–500 micrometers which consists of construction material, such as polyethylene, polypropylene, polyvinyl chloride, a polyvinylidene chloride, an ethylene–vinyl acetate copolymer, polyester, polyamide, and polystyrene, for example is mentioned.

When the adhesive property of a film and a slip resistance layer is insufficient, the thing to depend on applying a silane coupling agent, polyethyleneimine, etc. to a film beforehand and which carried out priming is used.

Color paper of fine quality, colored kraft paper, a coloured film, etc. which are colored in the color with brightness low as base materials, such as paper which provides a slip resistance layer, or a film, such as gray, are used more preferably than dirt is not conspicuous.

A thing with a thickness of 5 micrometers – 50 mm manufactured by wet process, a dry method, or direct method as a nonwoven fabric, for example by being made from polyethylene, polypropylene, polyester, polyamide, glass fiber, carbon fiber, a cellulose fiber, etc. is mentioned. Especially, in order to obtain slide resistance matting with an uphill sufficient feeling and comfortableness, a thing of 10 mm or less is preferred in respect of a not less than 70-micrometer thing and processability.

As a sheet of foam, that by which foaming treatment was carried out by methods, such as electron beam foaming and chemical blowing, can be illustrated by being made from polyethylene, polypropylene, polystyrene, polyvinyl chloride, etc. As for the thickness of a foam sheet, a thing (50 micrometers – about 50 mm) is illustrated. From the point on comfortableness and handling, an about 0.1–4-mm thing is especially preferred. As such a foam sheet, for example, rye TRON (the Sekisui Chemical make, polyethylene foaming sheet), a mirror mat (the product made from Japanese styrene paper, a polyethylene foaming sheet), etc. are mentioned.

Methods, such as the wet laminating method, the dry type laminating method, the hot melt laminating method, and the extrusion laminating method, are used for the lamination of base materials, such as paper in this design, or a film, a nonwoven fabric, or foam.

In this design, a slide resistance sheet as adhesives used for joining to matting, such as a tatami or \*\*, The water soluble binder like the above quoted by preparation of capsule content slip resistance layer coating liquid, a latex system binder, an oil-soluble binder, the monomer that has an ethylene nature unsaturated bond, oligomer, and a prepolymer are mentioned.

Aromatics, such as a smell of insecticides, such as miticide, an antifungal agent, or a rush, etc. can be included in the slide resistance sheet used for this design if needed.

#### "EXAMPLE"

Although an example is given to below and this design is explained to it, this design is not limited only to an example. Unless it refuses in particular, a "weight section" and "% of the weight" are shown respectively the "part" in an example, and "%".

The coating liquid of the following presentation was prepared as example 1 fizz microcapsule content coating liquid, it applied by the bar coating machine so that dry weight might become gray colored kraft paper ( $70\text{g}[\text{m}^{-2}]$ ) with  $20\text{ g/m}^2$ , and it heated for 20 seconds under 150 °C, and the slide resistance sheet was obtained.

It continues, A releasing paper. (what applied silicone to paper at the sheet of  $74\text{ g/m}^2$  which carried out the polyethylene lamination) — the binder (trade name: — Oliva Inn BPS-4940.) of a polyacrylic ester system After applying the Toyo Ink make by a roll coater so that it may become dry weight  $30\text{ g/m}^2$ , it pasted together to the above-mentioned slide resistance sheet, and the tuck sheet of slide resistance was obtained.

Next, after removing the releasing paper of the above-mentioned tuck sheet, this was pasted together to \*\*\*\*\* and slide resistance \*\*\*\*\* was obtained. Slip resistance layer coating liquid presentation (a part expresses a solid content reduced property)

Fizz microcapsule (trade name; what includes isobutane in Expancel WU-642, the product made by Expancel, and a vinylidene chloride acrylonitrile copolymer wall)

Ten-copy ethylene–vinyl acetate system latex (trade name; the SUMIKA flex time 753, the Sumitomo Chemical Co., Ltd. make, glass-transition-temperature-15 °C)

70-copy aluminium hydroxide (trade name; the HAIJI light H-42, the Showa Denko K.K. make) Even if it used

\*\*\*\*\* obtained 20 copies, having covered wooden floor, it was hardly slippery.

A 20-micrometer polyethylene film was joined for the slide resistance sheet and nonwoven fabric (the dry method nonwoven fabric using polyester, the Kuraray Co., Ltd. make) which were obtained like example 2 Example 1 as an adhesives layer.

It continues, A releasing paper. (what applied silicone to paper at the sheet of  $74 \text{ g/m}^2$  which carried out the polyethylene lamination) — the binder (trade name: — Oliva Inn BPS-4940.) of a polyacrylic ester system After applying the Toyo Ink make by a roll coater so that dry weight may serve as  $30 \text{ g/m}^2$ , it pasted together to the above-mentioned sheet and the tuck sheet of slide resistance was obtained.

Next, after removing the releasing paper of this tuck sheet, this was pasted together to \*\*\*\*\* and slide resistance \*\*\*\*\* was obtained.

Even if it used obtained \*\*\*\*\*, having covered wooden floor, it was hardly slippery. Cushioning properties are excellent compared with the thing of Example 1.

It was very comfortable.

In example 3 Example 2, the tuck sheet of slide resistance was similarly obtained except having used the foam polyethylene sheet (trade name: rye TRON, the Sekisui Chemical make, and 1 mm in thickness) instead of the nonwoven fabric.

Next, after removing the releasing paper of this tuck sheet, this was pasted together to the tatami and the slide resistance tatami was obtained.

Even if it used it, having covered wooden floor, it did not slide on the obtained tatami.

[Effect]

Even if it used it, having covered wooden floor, it hardly slid on the slide resistance matting of this design.

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**TECHNICAL FIELD**

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**[Industrial Application]**

This design is related with the slide resistance matting excellent in slide resistance, such as a tatami, \*\*, a carpet, and a mat.

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[Translation done.]

## PRIOR ART

## [Description of the Prior Art]

Various kinds of things are known by matting.

It is used for the following purposes etc., respectively.

\*\* The matting keep it from becoming dirty even if cover the room of the wooden floor usually used with its shoes on, and it enables it to go up with bare feet or it carries out every [ of the article / direct ] to a floor, \*\* The matting which covers a floor and prevents the dirt of the floor, the matting which covers \*\* floor and hides dirt and the bruise of the floor, \*\* There are the matting which covers a floor and gives cushioning properties to the floor, matting which covers \*\* floor and prevents the cold from an under floor, matting which covers \*\* wooden floor and changes a Western-style room into Japanese-style room space, matting which covers \*\* floor and accents, matting to which \*\* floor is covered and the dirt of bare feet or footwear is dropped, etc.

Specifically, matting, such as \*\*, a tatami mat, a carpet, or a mat, is used for the floor which consists of a tatami, a board, etc. These days, since the carpet currently used especially in residences, such as an apartment, having been fond serves as a hotbed of ticks easily, flooring(wooden floor)-ization of a floor progresses and, for this reason, use of \*\*\*\*\* and a tatami mat is in fashion.

However, since it is not usually necessarily being fixed to the floor, it is easy to move while in use, and if this tatami mat, \*\*, a carpet, a mat, etc. are not careful, they have the danger that the room will make it disorderly by the movement, or people will fall.



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EFFECT OF THE INVENTION

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[Effect]

Even if it used it, having covered wooden floor, it hardly slid on the slide resistance matting of this design.

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**TECHNICAL PROBLEM**

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**[Problem(s) to be Solved by the Device]**

As a result of inquiring in view of this actual condition, by providing a slip resistance layer in rear faces, such as a tatami, \*\*, a carpet, and a mat, this person finds out that matting without the above-mentioned problem is obtained, and came to complete this design.

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MEANS

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[The means for solving a technical problem]

In slide resistance matting in which this design laminates matting, an adhesive layer or an adhesives layer, a base, and a slip resistance layer at least, Slide resistance matting in which a slip resistance layer consists of a constituent which uses a fizz microcapsule, adhesives, and an inorganic pigment as the main ingredients, and a rate of a compounding ratio of this fizz microcapsule consists of three to 50 weight section to adhesives 100 weight section.

This design indicates slide resistance matting in which a base contains a nonwoven fabric or foam.

This design indicates slide resistance matting in which a base contains at least one base material chosen from paper and a film.

A slip resistance layer consists of a fizz microcapsule, adhesives, and paints, and a mode of this design is characterized by a rate of a compounding ratio of this fizz microcapsule being three to 50 weight section to adhesives 100 weight section.

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[Translation done.]

## OPERATION

## [Function]

A tatami, \*\*, a carpet, a mat, etc. can be illustrated as matting including various kinds of matting, such as a sheet shaped and mat state, about this design.

The matting of this design is explained still in detail based on a drawing.

Drawing 2 is a sectional view showing an example of the slide resistance matting known conventionally. The slide resistance matting (1) of Drawing 2 is what provided the slip resistance layer (3) in the rear face of matting (2) directly, and is a simple construct. Drawing 1, Drawing 3, and Drawing 4 are sectional views showing the slide resistance matting (1) of this design. The slide resistance matting (1) of Drawing 1 is what pasted together to the rear face of matting (2) base materials (4) which provided the slip resistance layer (3), such as paper or a film, via the adhesives layer (5). It excels in the point that the point that processing is easy and slip resistance layer to the main part of matting do not permeate matting from the slide resistance matting (1) of Drawing 2 etc. The slide resistance matting (1) of Drawing 3 is what was pasted together to the rear face of matting (2) via the adhesives layer (5), after pasting together to a nonwoven fabric or foam (6) base materials (4) which provided the slip resistance layer (3), such as paper or a film. In the case of use — the cushioning properties of a nonwoven fabric or foam (6) are effective, and comfortableness and a going-up feeling are better than the slide resistance matting (1) of Drawing 1 — it is comfortable. After the slide resistance matting (1) of Drawing 4 pastes together to a nonwoven fabric or foam (6) base materials (4) which provided the slip resistance layer (3), such as paper or a film. It is what constituted the base, pasted together base materials (9), such as another paper or a film, to the nonwoven fabric or foam side side, and pasted this layered product together to the rear face of matting (2) via the adhesives layer (5) continuously. Even if it compares with any of Drawing 1 and Drawing 3, it excels most in respect of processability, the amenity in the case of use, etc. The thing of the gestalt like Drawing 5 which provided the slip resistance layer in the rear face of matting (2) selectively as slide resistance matting of this design is mentioned.

A slip resistance layer (3) used for this design uses a fizz microcapsule, adhesives, and paints as the main ingredients, and a rate of a compounding ratio of this fizz microcapsule consists of 3 – 50 weight section to adhesives 100 weight section.

A slip resistance layer which becomes below from a presentation like the above is described.

A slip resistance layer containing a fizz microcapsule applies coating liquid which usually contains a fizz capsule, and it is continuously formed by carrying out heat foaming processing. For example, in a device of Drawing 1, Drawing 3, and Drawing 4. Usually, the smear of the capsule content coating liquid is carried out to base materials, such as paper or a film, etc. using a coater or a printing machine. Then, heat-treat, constitute a slide resistance sheet and then in a device of Drawing 1, said slide resistance sheet is stuck directly at matting. After sticking on matting (2) after pasting said slide resistance sheet together with a nonwoven fabric or foam in the case of Drawing 3, and pasting together a nonwoven fabric or foam (6) and a base material (9), and (paper or a film) one by one at said slide resistance sheet in the case of Drawing 4, it is obtained by sticking on matting (2). After constituting a base in which a base material, a nonwoven fabric, or foam pasted formation of a slip resistance layer together in a device of Drawings 3 or 4, it can also carry out, and in a device of Drawing 4, a slip resistance layer can also be formed after pasting of a base material, a nonwoven fabric or foam, and a base material.

In order to do easy work which sticks a slide resistance sheet on matting in a device of Drawing 1, Drawing 3, Drawing 4, and Drawing 5, for example, it constituted using an adhesive layer (7) as an adhesives layer (5), use of a sheet shown in Drawing 6 and Drawing 7 is desirable. After this slide resistance sheet removes a releasing paper (8), it is stuck on matting (2), and matting of Drawings 3 or 4 is obtained, respectively. After it sticks it with a releasing paper (8) after carrying out the smear of the formation of an adhesive layer in that case (7) to a direct base material, a nonwoven fabric or foam, etc., and it carries out the smear of the adhesive layer (7) to a \*\*\*\*\* method or a releasing paper (8), it is stuck with a base material, a nonwoven fabric or foam, etc., and is performed by any of a \*\*\*\*\* method they are. Thus, an order of processing in this design is suitably chosen in consideration of physical properties, such as the heat resistance of material, or processability, and workability to be used.

When using a binder as adhesives, binders, such as a rubber system, acrylic, a polyether system, and an ethylene-vinyl acetate system, are used, for example. The releasing paper (8) in particular both used is not limited, but a publicly known thing is used in this industry.

Incidentally, adhesives or a binder is applied so that it may usually become the range of 5 – 100 g/cm<sup>2</sup> with dry weight.

A fizz microcapsule and the adhesives for adhering this to a base are blended by a specific ratio, and

microcapsule content coating liquid is prepared considering what added paints further as a fundamental component.

The fizz microcapsule used for this design is a microcapsule which has the character in which particle diameter increases with heating.

Low-boiling-point hydrocarbon like n-butane, i-butane, pentane, and a neopentane as a core substance is specifically included, Acrylic ester like a vinylidene chloride, acrylonitrile, and methyl methacrylate (meta) as a wall membrane agent of a capsule, The microcapsule which uses the thermoplastics which uses an aromatic vinyl compound like styrene as the main ingredients (as a commercial capsule). It is mentioned that the Matsumoto microsphere F-30, F-50, F-80 (product made from the Matsumoto fats and oils), Expancel WU-642, WU-551, and WU-461 (product made from Japanese phyllite) can be illustrated etc.

As adhesives in a slip resistance layer, when applying as an aqueous system, a water soluble binder and a latex system binder are used, and when applying as a non-aqueous system, an oil-soluble binder is used. When hardening by an electron beam or ultraviolet rays, the monomer which has an ethylene nature unsaturated bond, oligomer, or a prepolymer is used.

As a water soluble binder, for example Gelatin, albumin, casein, Grain starch, pregelatinization starch, oxidized starch, etherification starch, esterification starch, Carboxymethyl cellulose, hydroxyethyl cellulose, agar, Water-soluble nature or semisynthesis high molecular compounds, such as sodium alginate and gum arabic, Polyvinyl alcohol, denaturation polyvinyl alcohol, a polyvinyl pyrrolidone, Water-soluble synthetic high polymers, such as polyacrylic acid, polyacrylamide, an ethylene maleic anhydride copolymer, a styrene maleic anhydride copolymer, a methyl vinyl ether maleic anhydride copolymer, isobutylene, a maleic anhydride copolymer, are mentioned.

As a latex system binder, styrene butadiene latex, Acrylonitrile butadiene latex, acrylic ester system latex, vinyl acetate system latex, polyvinylidene chlorides latex, methyl methacrylate butadiene latex, these carboxy denaturation (for example, acrylic acid) latex, etc. are mentioned.

As an oil-soluble binder, for example Rosin, KOPARU, Dalman, gilsonite, Natural resins, such as zein, hardened rosin, dimerization rosin, polymerization rosin, maleic acid resin, Fumaric acid resin, methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, Hydroxypropylcellulose, ethyl hydroxyethyl cellulose, Cellulose acetate propionate, cellulose acetate butyrate, Semi-synthetic resin, such as a nitrocellulose, phenol resin, xylene resin, Urea resin, melamine resin, ketone resin, coumarone-indene resin, petroleum resin, Terpene resin, cyclized rubber, chlorinated rubber, alkyd resin, polyamide resin, an acrylic resin, polyvinyl chloride, polyvinyl acetate, a polyvinyl chloride acetate copolymer, chlorinated polypropylene styrene resin, an epoxy resin, polyurethane resin, a polyvinyl butyral, etc. are mentioned.

As the monomer which has an ethylene nature unsaturated bond hardened by an electron beam or ultraviolet rays, oligomer, and a prepolymer, For example, styrene, methyl methacrylate, butyl methacrylate, polyethylene-glycol diacrylate, Propylene glycol diacrylate, pentaerythritol acrylate, Trimethylolpropane diacrylate, pentaerythritol tetraacrylate, The reactant of hexanediol diacrylate, 1,2-butanediol diacrylate, an epoxy resin, and acrylic acid, the condensate of maleic acid, acrylic acid, and a diethylene glycol, etc. are mentioned.

The glass transition temperature in which the especially most desirable thing as adhesives tends to reveal high slide resistance is a thing 40 \*\* or less.

A fizz microcapsule and adhesives are blended so that a fizz microcapsule may usually serve as five to 30 weight section preferably three to 50 weight section to adhesives 100 weight section.

As a medium used for non-aqueous system coating liquid, for example Benzene, toluene, Xylene, hexane, cyclohexane, trichloroethylene, methyl ethyl ketone, Methyl isobutyl ketone, methyl acetate, ethyl acetate, butyl acetate, methyl cellosolve, Ethylcellosolve, butyl cellosolve, methanol, ethanol, n-propyl alcohol, isopropyl alcohol, n-butanol, n-hexanol, cyclohexanol, a diethylene glycol, etc. are mentioned.

When hardening by ultraviolet rays using the monomer which has an ethylene nature unsaturated bond hardened by ultraviolet rays as adhesives, oligomer, and a prepolymer, a sensitizer is added for a photopolymerization initiator again if needed in coating liquid.

As a photopolymerization initiator, for example Benzoquinone, phenanthrene quinone, A naphthoquinone, diisopropyl phenanthrene quinone, benzoin butyl ether, benzoin, furoin butyl ether, a Michler's ketone, a MIHIRA thioketone, fluorenone, trinitro fluorenone, etc. are mentioned.

The loadings of a photopolymerization initiator are usually the range of 0.1 to 10 weight section to ethylene nature unsaturated compound 100 weight section.

As a sensitizer, triethanolamine, N-methyldiethanolamine, N,N-dimethylethanolamine, N-methylmorpholine, etc. are mentioned, for example.

As for the gestalt of fizz microcapsule content coating liquid, a fizz microcapsule and inorganic pigments other than adhesives, such as silica, calcium carbonate, aluminium hydroxide, clay, kaolin, titanium oxide, and a zinc

oxide, were added by coating liquid. Prevention from blocking is aimed at and ten to 80 weight section is usually more preferably added by addition of an inorganic pigment five to 150 weight section to adhesives 100 weight section. To coating liquid, fine adhesion particles, a surface-active agent, a dispersing agent, a spray for preventing static electricity, a defoaming agent, colorant, fluorescent dye, etc. which are further used for release agents, such as polyethylene wax, and the gummed paper for re peeling off if needed can be added suitably. As a coater used, an air knife coater, a bar coating machine, a roll coater, a photogravure coating machine, etc. are used, and photogravure, a screen, flexo one, etc. are used as a printing machine.

the case where a fizz capsule layer is used as a slip resistance layer in this design -- a slip resistance layer -- dry weight -- the range of 3 - 500 g/m<sup>2</sup> -- it is provided so that it may become the range of 12 - 70 g/m<sup>2</sup> more preferably. Incidentally, if there is too little weight, sufficient slide resistance will not be obtained. By less than 12 g/m<sup>2</sup>, the fall of the slide resistance by repetitive friction is large, therefore when using it for a long period of time, it may become a problem. On the other hand, if there is too much coverage, about slide resistance and abrasion resistance, it is satisfactory, but it is not desirable in respect of economical efficiency.

Foaming of a capsule is usually performed under about 80-300 \*\* conditions using heating apparatus, such as a hot-air-drying zone of a coater, an infrared irradiation device, and a heating super calender.

As paper used as a base material about this design, a thing with a thickness of about 10-500 micrometers of paper of fine quality, kraft, art paper, coat paper, fine coated paper, a synthetic paper, etc. is mentioned, for example. The thing which made knot \*\*, a bark, shives, etc. mix in colored kraft especially is preferred from a point of fanciness.

As a film, a film with a thickness of about 5-500 micrometers which consists of construction material, such as polyethylene, polypropylene, polyvinyl chloride, a polyvinylidene chloride, an ethylene-vinyl acetate copolymer, polyester, polyamide, and polystyrene, for example is mentioned.

When the adhesive property of a film and a slip resistance layer is insufficient, the thing to depend on applying a silane coupling agent, polyethyleneimine, etc. to a film beforehand and which carried out priming is used.

Color paper of fine quality, colored kraft paper, a coloured film, etc. which are colored in the color with brightness low as base materials, such as paper which provides a slip resistance layer, or a film, such as gray, are used more preferably than dirt is not conspicuous.

A thing with a thickness of 5 micrometers - 50 mm manufactured by wet process, a dry method, or direct method as a nonwoven fabric, for example by being made from polyethylene, polypropylene, polyester, polyamide, glass fiber, carbon fiber, a cellulose fiber, etc. is mentioned. Especially, in order to obtain slide resistance matting with an uphill sufficient feeling and comfortableness, a thing of 10 mm or less is preferred in respect of a not less than 70-micrometer thing and processability.

As a sheet of foam, that by which foaming treatment was carried out by methods, such as electron beam foaming and chemical blowing, can be illustrated by being made from polyethylene, polypropylene, polystyrene, polyvinyl chloride, etc. As for the thickness of a foam sheet, a thing (50 micrometers - about 50 mm) is illustrated. From the point on comfortableness and handling, an about 0.1-4-mm thing is especially preferred. As such a foam sheet, for example, rye TRON (the Sekisui Chemical make, polyethylene foaming sheet), a mirror mat (the product made from Japanese styrene paper, a polyethylene foaming sheet), etc. are mentioned.

Methods, such as the wet laminating method, the dry type laminating method, the hot melt laminating method, and the extrusion laminating method, are used for the lamination of base materials, such as paper in this design, or a film, a nonwoven fabric, or foam.

In this design, a slide resistance sheet as adhesives used for joining to matting, such as a tatami or \*\*, The water soluble binder like the above quoted by preparation of capsule content slip resistance layer coating liquid, a latex system binder, an oil-soluble binder, the monomer that has an ethylene nature unsaturated bond, oligomer, and a prepolymer are mentioned.

Aromatics, such as a smell of insecticides, such as miticide, an antifungal agent, or a rush, etc. can be included in the slide resistance sheet used for this design if needed.

## EXAMPLE

## "EXAMPLE"

Although an example is given to below and this design is explained to it, this design is not limited only to an example. Unless it refuses in particular, a "weight section" and "% of the weight" are shown respectively the "part" in an example, and "%."

The coating liquid of the following presentation was prepared as example 1 fizz microcapsule content coating liquid, it applied by the bar coating machine so that dry weight might become gray colored kraft paper ( $70 \text{ g/m}^2$ ) with  $20 \text{ g/m}^2$ , and it heated for 20 seconds under  $150^\circ\text{C}$ , and the slide resistance sheet was obtained.

It continues, A releasing paper. (what applied silicone to paper at the sheet of  $74 \text{ g/m}^2$  which carried out the polyethylene lamination) -- the binder (trade name: -- Oliva Inn BPS-4940.) of a polyacrylic ester system After applying the Toyo Ink make by a roll coater so that it may become dry weight  $30 \text{ g/m}^2$ , it pasted together to the above-mentioned slide resistance sheet, and the tuck sheet of slide resistance was obtained.

Next, after removing the releasing paper of the above-mentioned tuck sheet, this was pasted together to \*\*\*\*\* and slide resistance \*\*\*\*\* was obtained. Slip resistance layer coating liquid presentation (a part expresses a solid content reduced property)

Fizz microcapsule (trade name; what includes isobutane in Expancel WU-642, the product made by Expancel, and a vinylidene chloride acrylonitrile copolymer wall)

Ten-copy ethylene-vinyl acetate system latex (trade name; the SUMIKA flex time 753, the Sumitomo Chemical Co., Ltd. make, glass-transition-temperature- $15^\circ\text{C}$ )

70-copy aluminium hydroxide (trade name; the HAIJI light H-42, the Showa Denko K.K. make) Even if it used \*\*\*\*\* obtained 20 copies, having covered wooden floor, it was hardly slippery.

A 20-micrometer polyethylene film was joined for the slide resistance sheet and nonwoven fabric (the dry method nonwoven fabric using polyester, the Kuraray Co., Ltd. make) which were obtained like example 2 Example 1 as an adhesives layer.

It continues, A releasing paper. (what applied silicone to paper at the sheet of  $74 \text{ g/m}^2$  which carried out the polyethylene lamination) -- the binder (trade name: -- Oliva Inn BPS-4940.) of a polyacrylic ester system After applying the Toyo Ink make by a roll coater so that dry weight may serve as  $30 \text{ g/m}^2$ , it pasted together to the above-mentioned sheet and the tuck sheet of slide resistance was obtained.

Next, after removing the releasing paper of this tuck sheet, this was pasted together to \*\*\*\*\* and slide resistance \*\*\*\*\* was obtained.

Even if it used obtained \*\*\*\*\* , having covered wooden floor, it was hardly slippery. Cushioning properties are excellent compared with the thing of Example 1.

It was very comfortable.

In example 3 Example 2, the tuck sheet of slide resistance was similarly obtained except having used the foam polyethylene sheet (trade name: rye TRON, the Sekisui Chemical make, and 1 mm in thickness) instead of the nonwoven fabric.

Next, after removing the releasing paper of this tuck sheet, this was pasted together to the tatami and the slide resistance tatami was obtained.

Even if it used it, having covered wooden floor, it did not slide on the obtained tatami.

**\* NOTICES \***

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

Drawing 1, Drawing 3, Drawing 4, and Drawing 5 are sectional views showing the example of this design, and Drawing 6 and Drawing 7 are sectional views showing the slide resistance sheet before pasting together to matting. Drawing 2 is a sectional view showing the conventional slide resistance matting.

- (1) .... Slide resistance matting
- (2) .... Matting
- (3) .... Slip resistance layer
- (4) .... Base materials, such as paper or a film
- (5) .... Adhesives layer
- (6) .... A nonwoven fabric or foam
- (7) .... Adhesive layer
- (8) .... Releasing paper
- (9) .... Base materials, such as paper or a film

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[Translation done.]